# Issues of Scale and Inference

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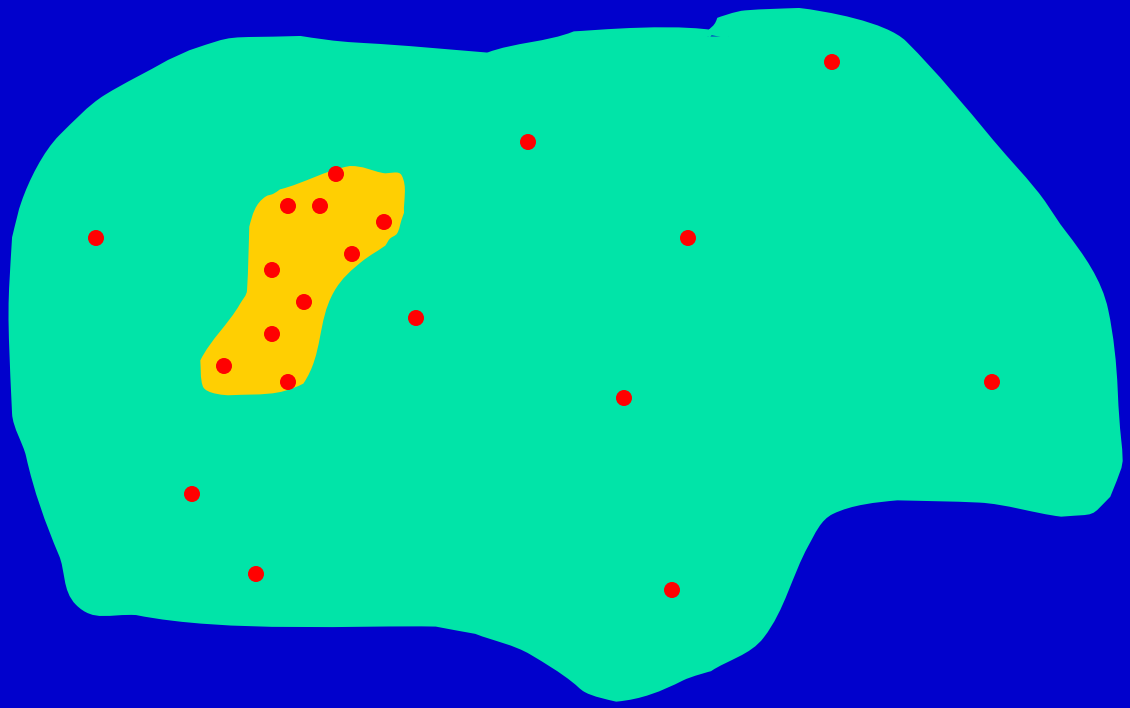
## Boreal Partners in Flight

# At what geographic scale should we monitor long-term trends?

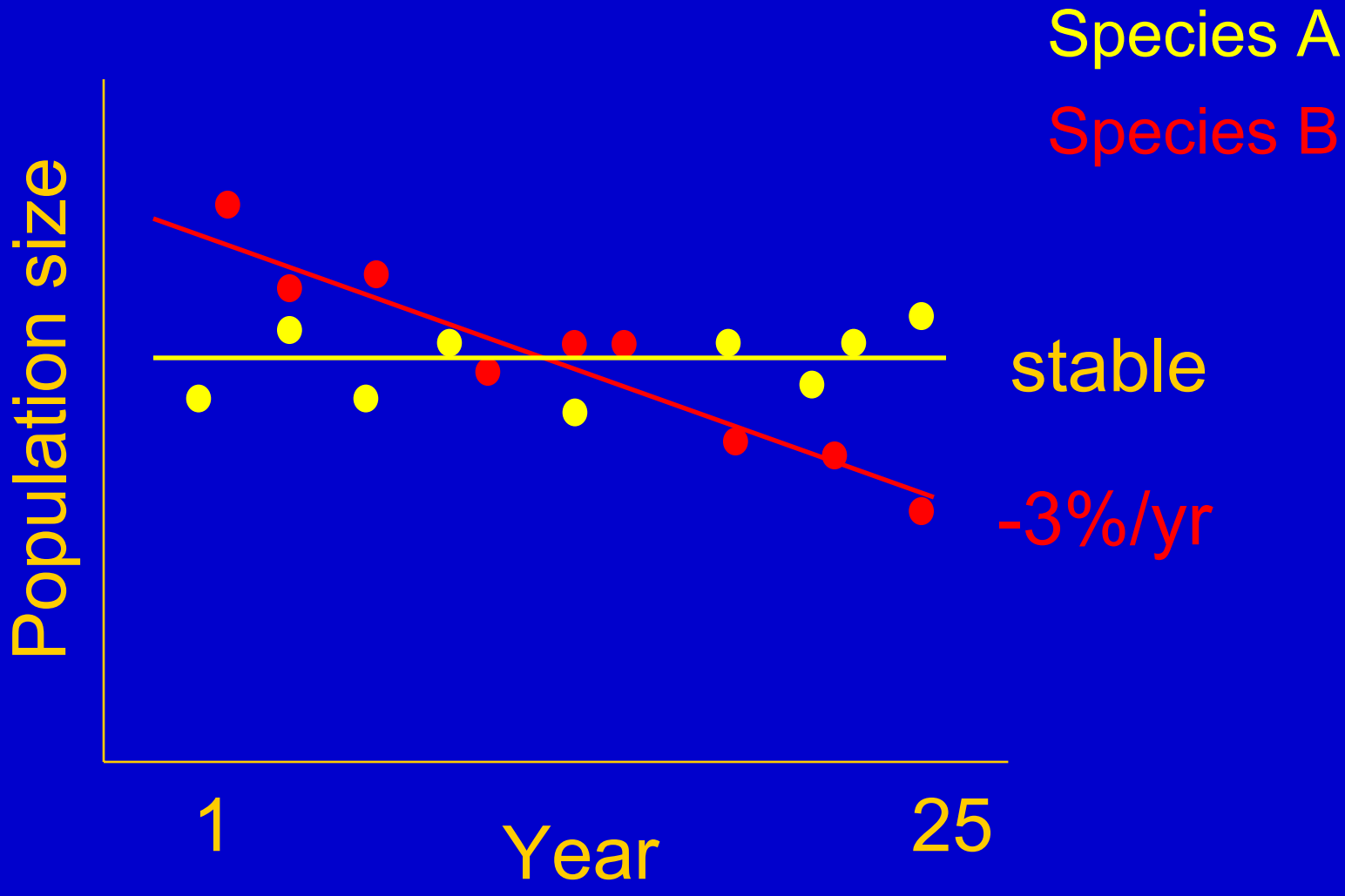
- Ecoregion
- Land-management unit

# Sample size requirements

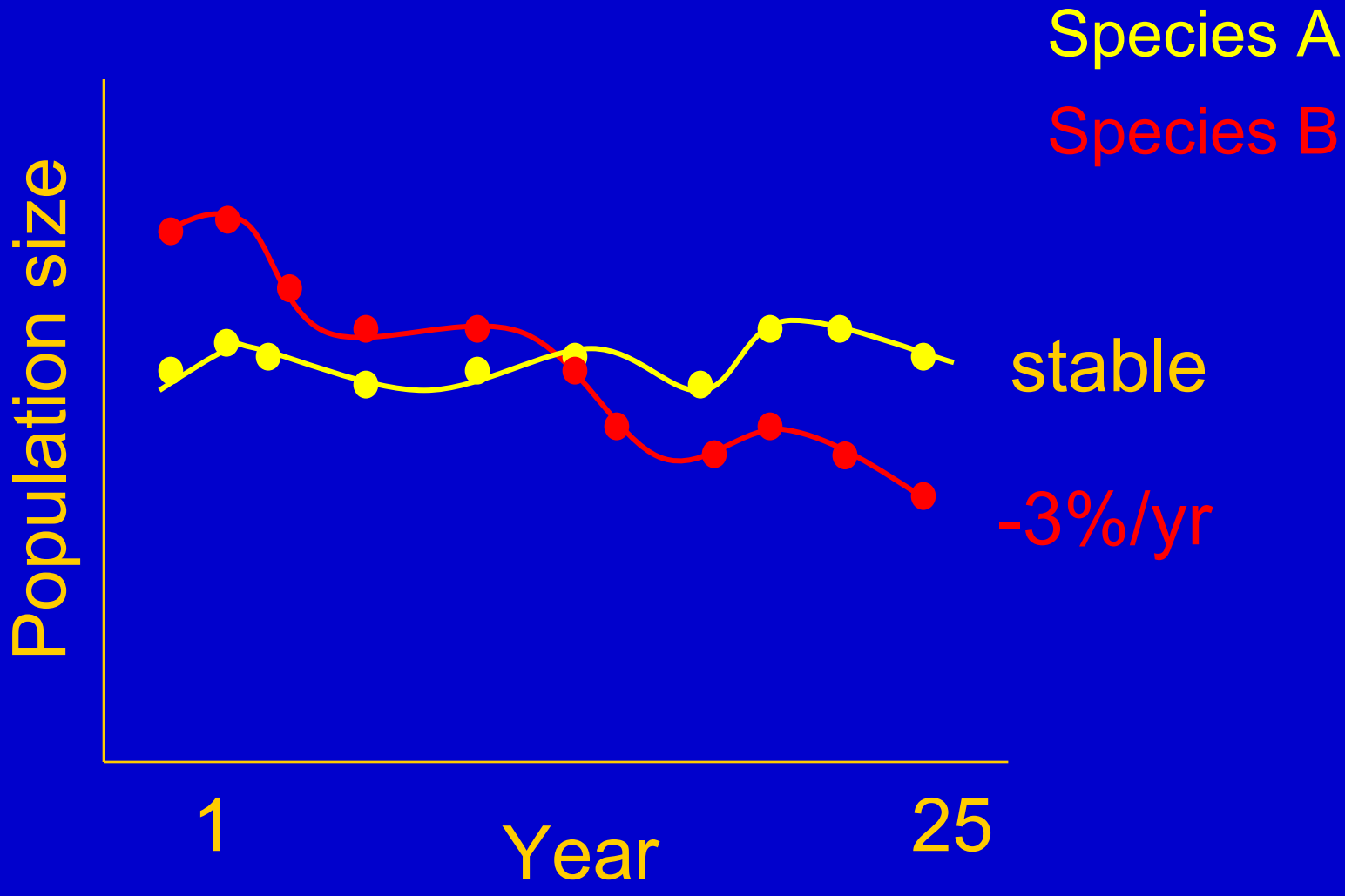
- Number of samples needed is largely independent of the size of area being monitored



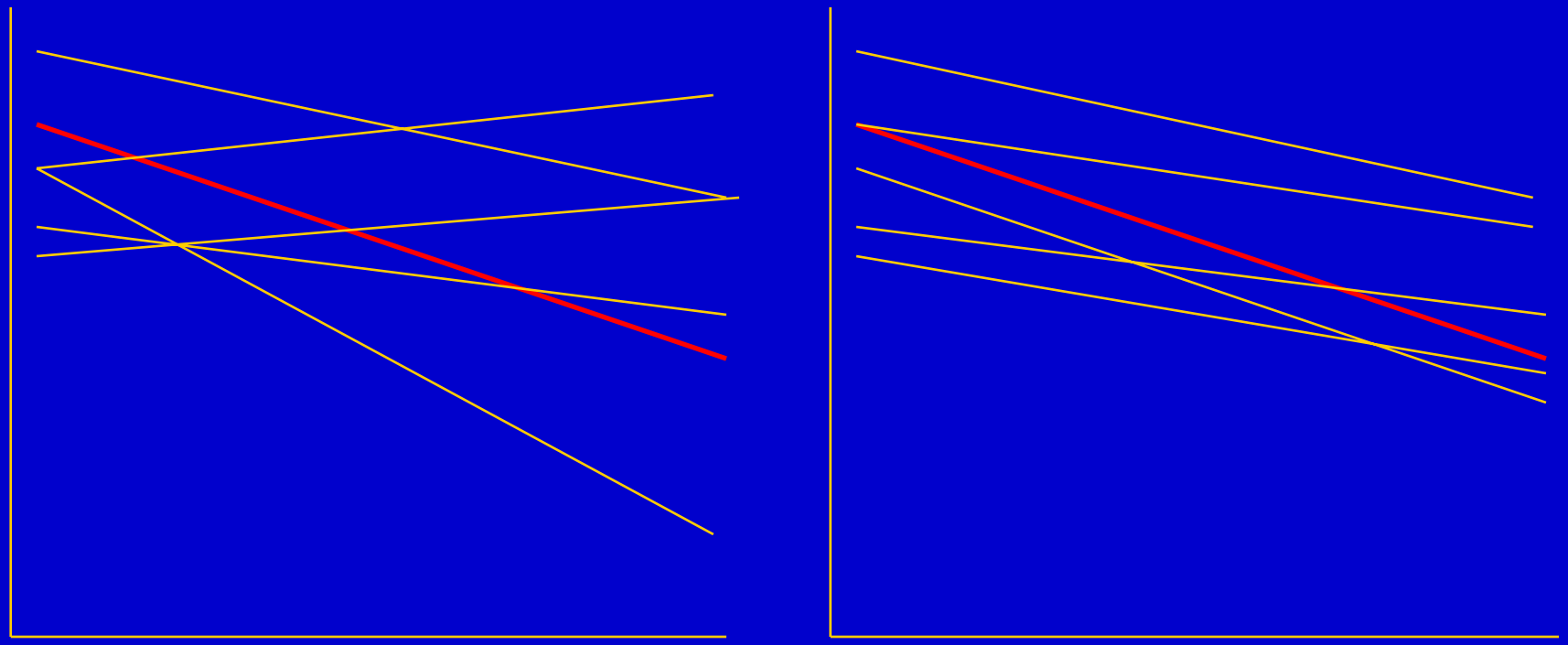
# Population trend is slope of line



# . . . or curve



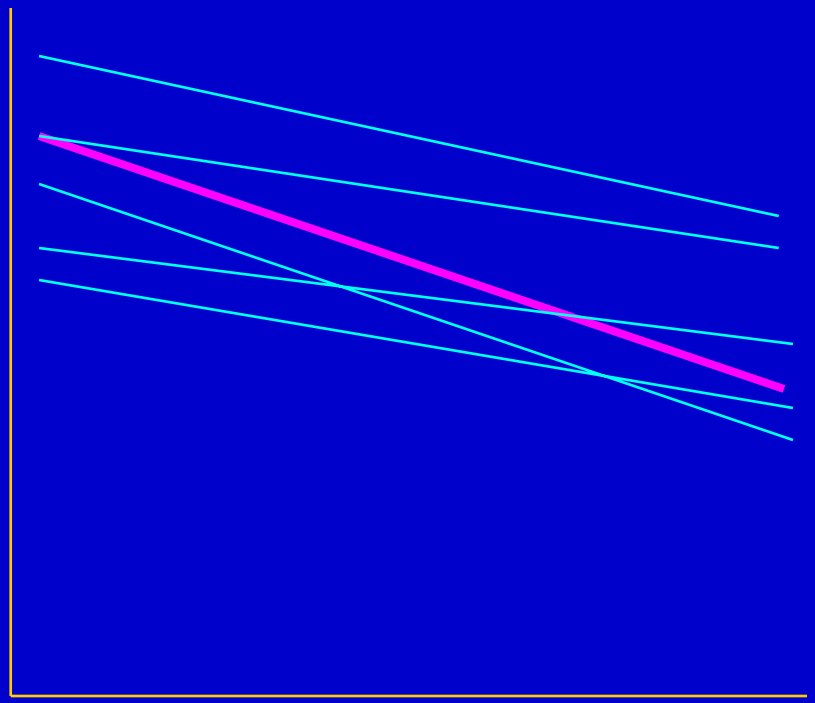
# Relative power to detect regional trend



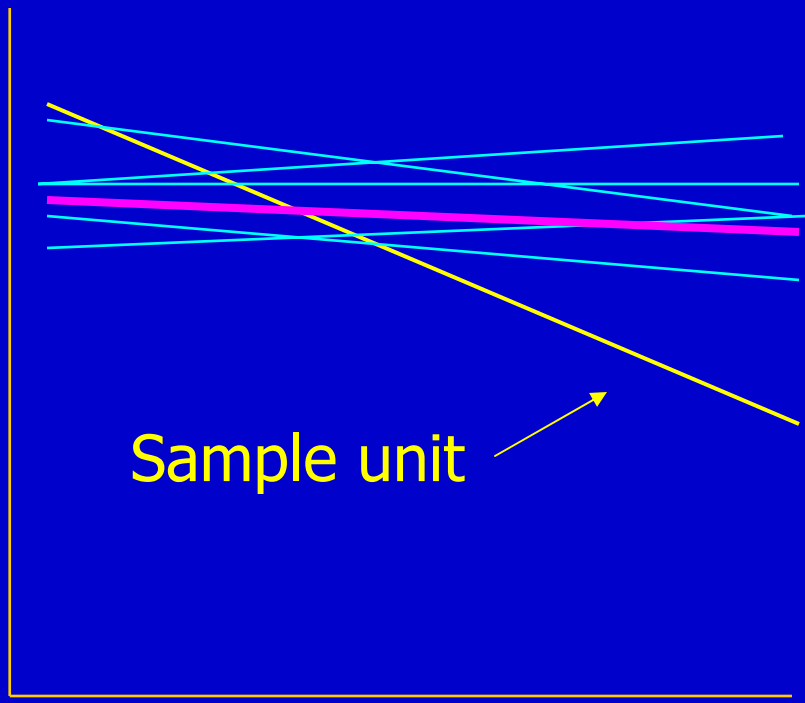
Low

High

# Triggering more intense efforts



Regional decline

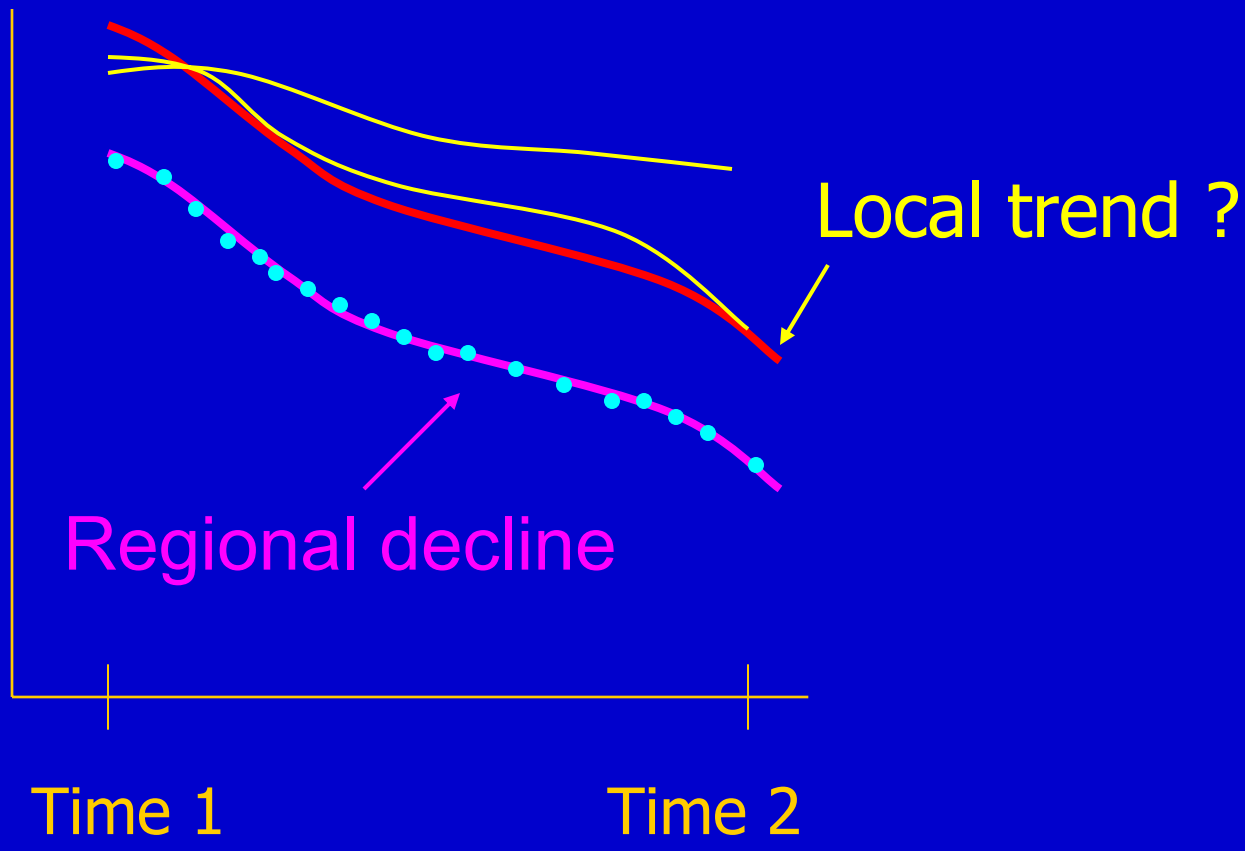



Local decline

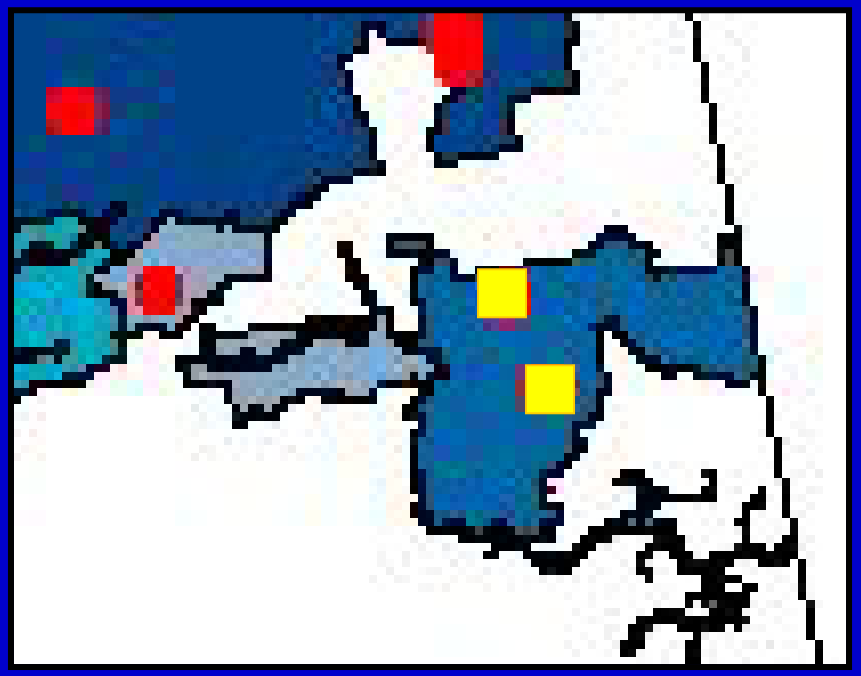
# Flexibility in sampling design

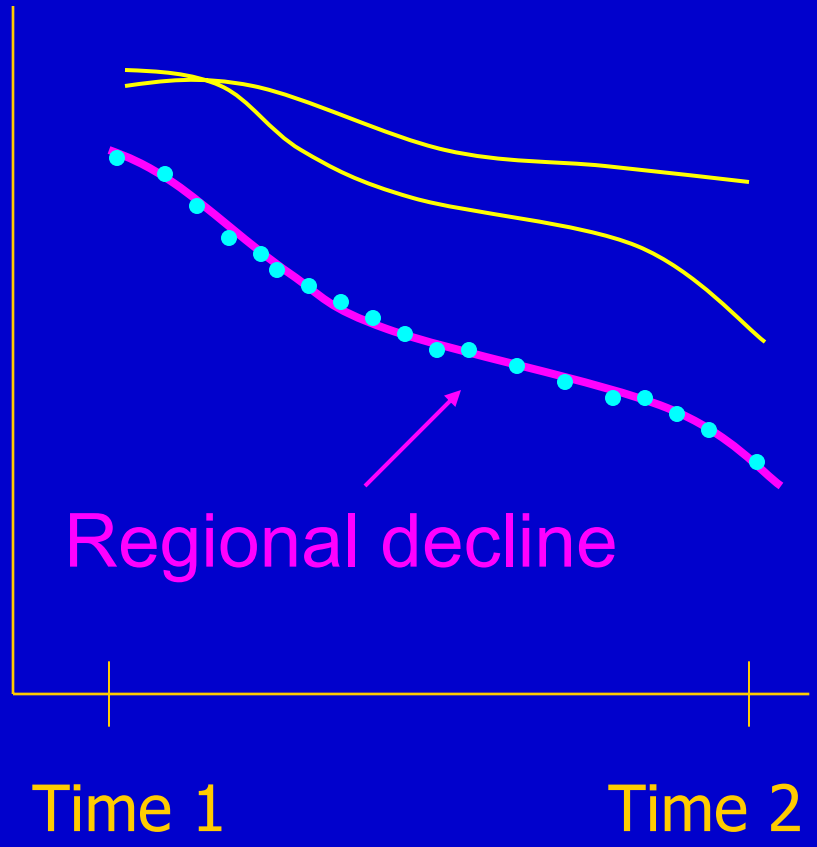
- Geographically stratified random design
  - Can intensify effort within strata
    - Can sample specific land units more intensively if desired
    - Can conduct initial inventory when resources available
    - Can repeat inventory sample at some later time

# Repeat of initial inventory to test local trend

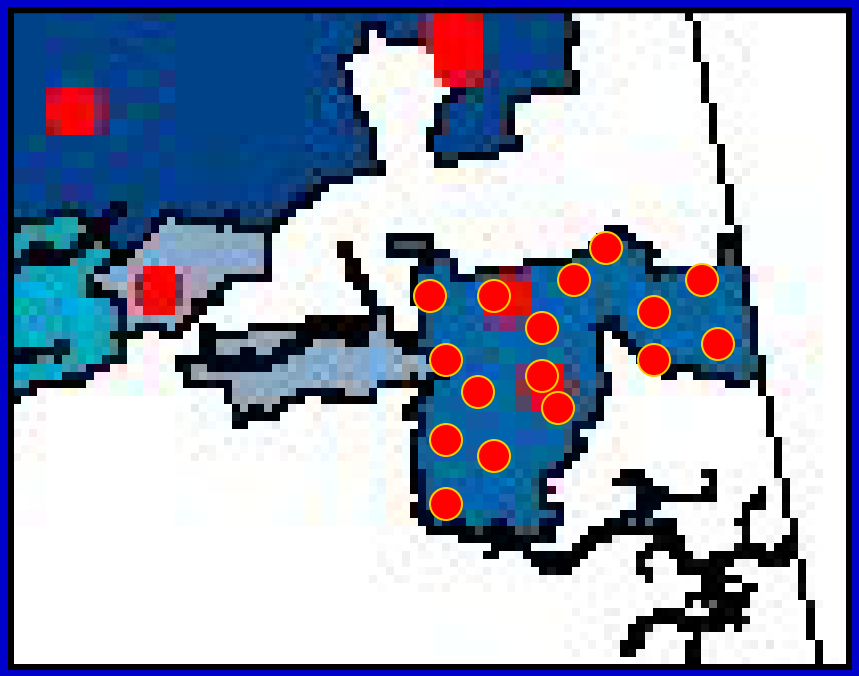


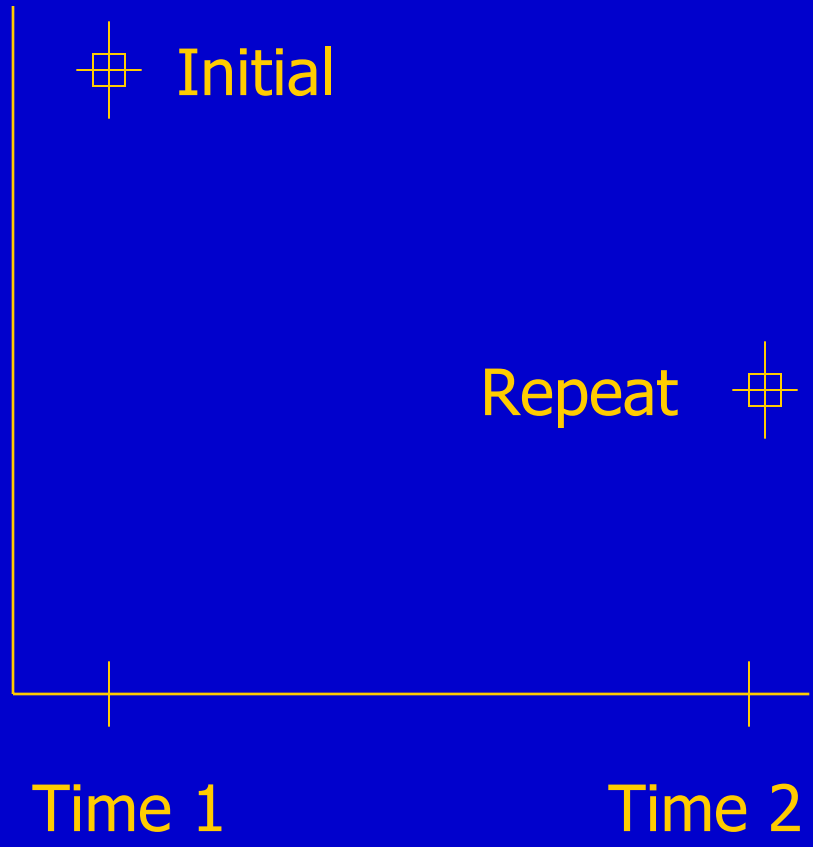
# Yukon-Charley



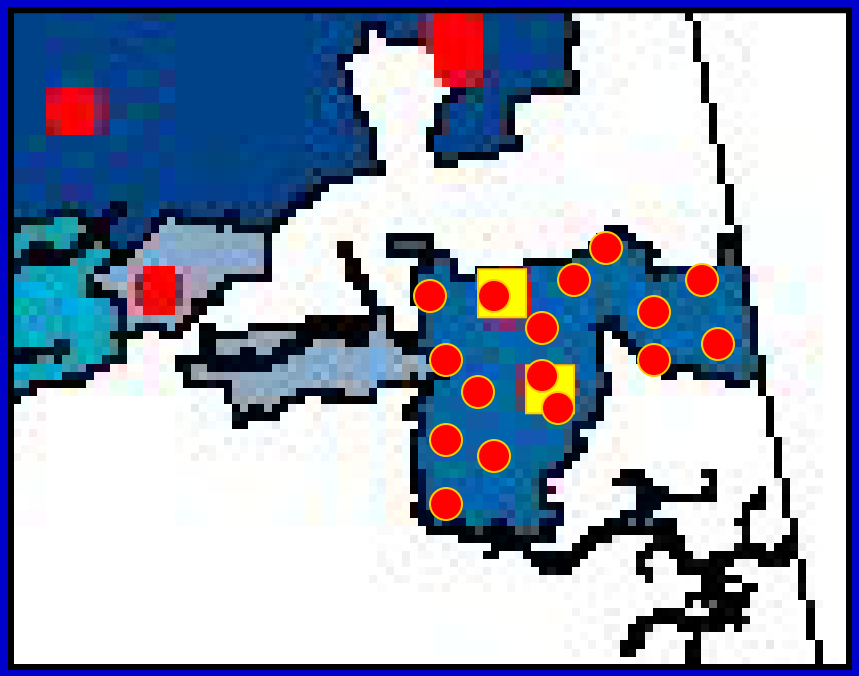


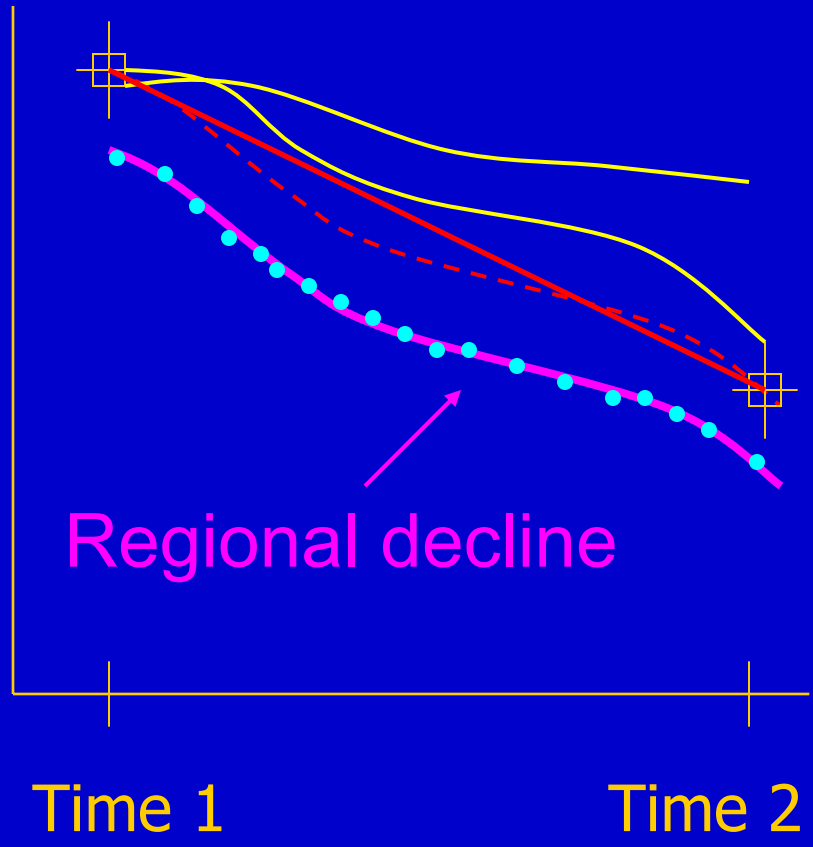
# Yukon-Charley inventory





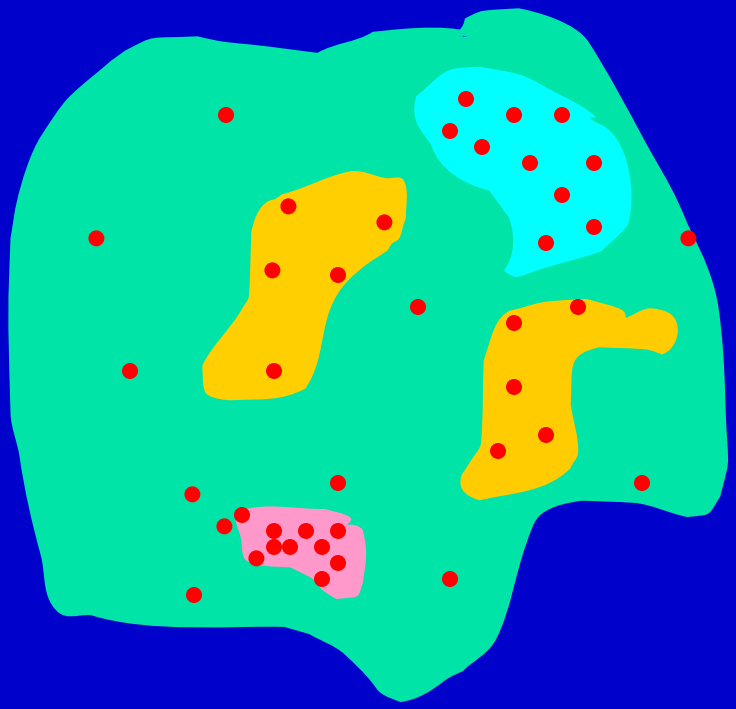
# Yukon-Charley





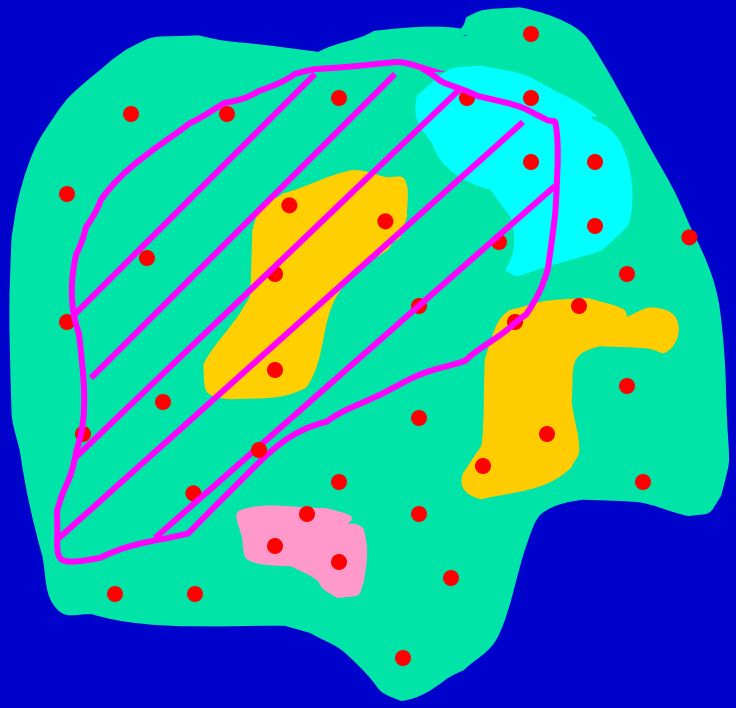
# Sample design

Specific management question with current landscape



Pre-stratified random sample

Long-term monitoring for unanticipated factors or changing landscape



Random sample with post-stratification

# Landscape-level changes across time

- Management questions
  - Fire
  - Disease and insect outbreaks
  - Timber management
  - Resource development
  - Recreational use
  - Global warming
  - Changes in biodiversity

# Flexibility in sampling design

- Can continue to refine picture of current status, distribution, and habitat use
  - Survey new additional random plots each year when resources available
  - Don’t need to be repeated
  - Can be repeated at some point in future
- Can ask specific management questions with same design, though less efficient